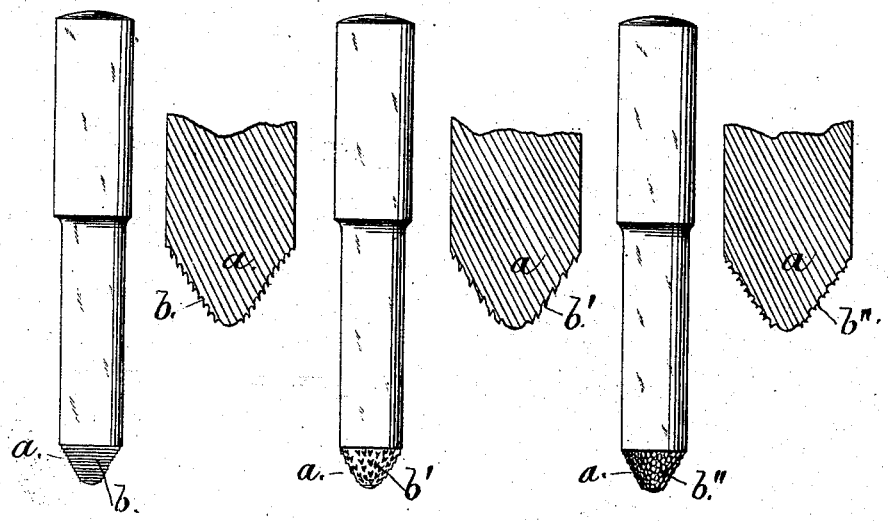
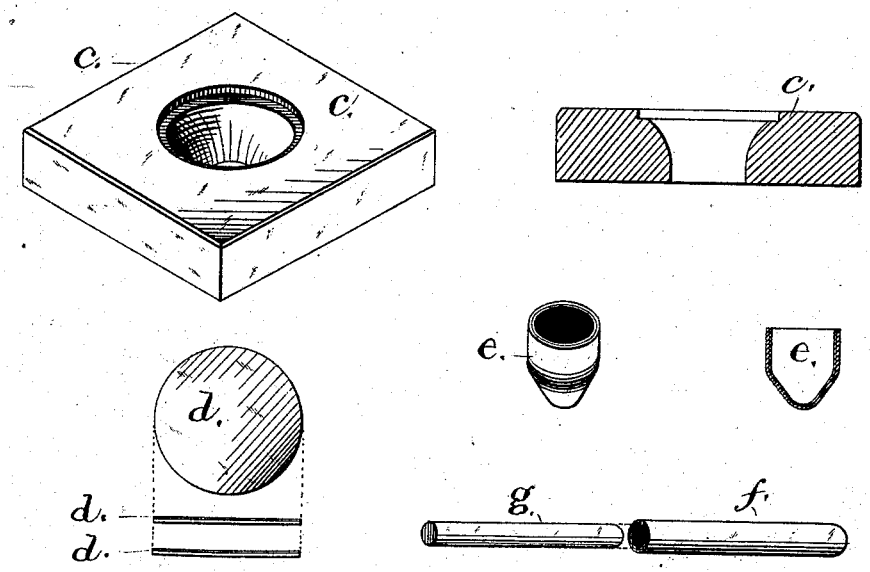
J. S. PALMER.

Plunger for Drawing Tubular Articles.

No. 211,342. Patented Jan. 14, 1879.

Fig. 1. Fig. 2 Fig. 3.





WITNESSES:

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IMPROVEMENT IN PLUNGERS FOR DRAWING TUBULAR ARTICLES.

Specification forming part of Letters Patent No. **211,342**, dated January 14, 1879; application filed November 23, 1878.

CASE A.

To all whom it may concern:

Be it known that I, JOHN S. PALMER, of Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Tools Used for Drawing Metallic Shells from a Disk or Sheet of Metal; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

My invention relates to tools used for drawing metallic shells from a disk or sheet of metal, and usually known as "drawing-punches," though they do not punch a hole; and it consists in the special form and construction of the forward or operative end of such tools.

Tools of this class are usually made flat-ended, and with the sharp edge or angle of such end slightly taken off or beveled, and each successive one of the series of tools is similarly made, but of smaller diameter; and whenever it is necessary that the finished article thus drawn into the form of a tube closed at one end shall have a conical shape at such end—as, for instance, in a cartridge-case—this conical part is formed at the last drawing; but in the manufacture of finger-rings or other articles where plated metal is to be treated, usually called in the jewelry manufacture "stock-plate"—that is, a duplex or compound sheet or piece of metal composed of a plate of base metal overlaid or plated with a more precious metal, such as an alloy of gold—the two metals have different degrees of hardness, malleability, and ductility, the gold alloy being usually the harder one, and less malleable and ductile in its character; and there is therefore a liability of the alloy to separate from the baser metal when subjected to so severe a strain as is necessarily produced by the square-ended drawing tool, so that the entire end or bottom that is presented at the first drawing action cannot be utilized because the alloy or more precious metal will crack or peel up from the soldering at that point or portion where the angle or corner was first turned up, so that only that portion which is turned up at the first drawing will be perfect.

If a mere conical point upon the tool be used, and such point be finished smoothly, as is required for the other parts of the tool, it will, by reason of such smoothness, meet with but little resistance, especially in connection with the oil which is necessarily used to permit the withdrawal of the tubular metal from the forming tool, and the effect is that the extreme point of the metal or shell under treatment will be reduced to an undue and disproportioned thinness, and will not be able to endure the strains of the subsequent drawings, and the bottom will come out, and then all further drawing is impossible.

To avoid these difficulties and losses, I make the extremity of the tool not only conical, as shown at *a* in Fig. 1, but I make upon such conical part a roughened surface—such, for instance, as a series of grooves, *b b*, &c., having sharp advancing edges or ridges at such an angle as to take hold of and fasten into the base metal of the shell under treatment while it is being formed or fashioned around the tool. This enables the enlarged bearing-surface afforded by the conical end, as contrasted with a flat end of a tool, to sustain its full and equal proportion of the drawing strain upon the entire surface of the cone in case the strain be severe enough to require it.

It will be evident, therefore, that there will be no abrupt turn on the shell, as the sides of the cone are always at an obtuse angle with the cylindrical body of the shell, and no breaking up of the plated metal from its soldering, and that all the metal down to the smallest size needed to be drawn will be utilized and its integrity preserved throughout all of the successive drawings.

Instead of annular grooves with sharp edges, the conical point may have projecting points or spurs, as shown at *b* and *b'* in Figs. 2 and 3, adapted to take hold of and fasten into the baser metal of the shell, as above mentioned; or it may have both the sharp ridges and the points, and these as well as the grooves and sharp edges may be located or disposed on the cone in any preferred manner

so long as they are adapted to take a hold or purchase upon the base metal to effect the end sought, as heretofore explained.

In the drawings, *c* represents a die for drawing, and *d* a blank of plated metal to be drawn by means of the die and the tool *a*; *e*, a shell made by the first drawing; *f*, the same reduced by four successive drawings and ready for rolling; *g*, a wire core to be inserted in the shell, if desired, or left out altogether, during the subsequent processes of rolling.

When a core is used, the gold or alloy of the shell should be twice as thick as is required when such core or wire is not used, in order to produce in either case an article of the same weight of precious metal, and for the reason that when the shells are afterward reduced by rolling they will admit of being rolled out to about twice the length with the core inside that they can be without such core, such increase of length necessarily reducing the thickness of the gold proportionately unless previously made thick enough to compensate for such reduction. The weight of the wire core should be about the same as the weight of the shell; but it may be either larger or smaller, as desired.

The subsequent process of rolling, for the purpose of preparing and shaping or fashioning these drawn shells, to adapt them for being made into various articles—such as finger-rings, parts of musical or surgical instruments, and other articles—need not here be described; and my improvements in rolling will form the subject-matter of another and independent application for a patent.

I claim—

A tool for drawing metals having a conical point provided with grooves or their described equivalents, presenting sharp points or edges to fasten into or take hold of the base metal of the shell or stock, substantially as described.

JOHN S. PALMER.

Witnesses:

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